NOTICE

All drawings located at the end of the document.

REF: 02-RF-01125, JLB-023-02

Draft Environmental Restoration RFCA Standard Operating Protocol for Routine Soil Remediation FY2002 Notification #02-04

March 2002

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ACRONYMS

AL	action level
D&D	Decontamination and Decommissioning
COC	contaminant of concern
cy	cubic yard
EDDIE	Environmental Data Dynamic Information Exchange
ER	Environmental Restoration
ER RSOP	Environmental Restoration RSOP for Routine Soil Remediation
FY	Fiscal Year
IA	Industrial Area
IASAP	Industrial Area Sampling and Analysis Plan
IHSS	Individual Hazardous Substance Site
mg/L	milligram per liter
OPWL	Original Process Waste Lines
PAC	Potential Area of Concern
PCB	polychorinated biphenyl
pCi/g	picocuries per gram
PCOC	potential contaminant of concern
POC	Point of Compliance
POE	Point of Evaluation
RCRA	Resource Conservation and Recovery Act
RFCA	Rocky Flats Cleanup Agreement
RFETS	Rocky Flats Environmental Technology Site
RSOP	RFCA Standard Operating Protocol
SVOC	semivolatile organic compound
UBC	Under Building Contamination
µg/L	micrograms per liter
VOC	volatile organic compound

1.0 INTRODUCTION

This Environmental Restoration (ER) Rocky Flats Cleanup Agreement (RFCA) Standard Operating Protocol (RSOP) for Routine Soil Remediation (ER RSOP) (DOE 2002) Fiscal Year (FY)02 Notification includes the notification to remediate Individual Hazardous Substance Sites (IHSSs), Potential Areas of Concern (PACs), and Under Building Contamination (UBC) Sites at the Rocky Flats Environmental Technology Site (RFETS) Industrial Area (IA) during FY02 The purpose of this Notification is to invoke the ER RSOP for the IHSSs listed in Table 1 Activities specified in the ER RSOP are not reiterated here However, deviations from the ER RSOP are noted where appropriate

Proposed remediation sites covered under ER RSOP Notification #02-04 are listed in Table 1 and the locations are shown on Figure 1

Table 1
FY02 Potential Remediation Areas

IHSS	PAC/UBC	PCOC	Media	Volume
300-6	300-702 – Pesticide Shed	Pesticides/Herbicides	Surface Soil	<1cy
500-6	500-906 – Asphalt Surface Near Building 559	Volatile organic compounds (VOCs)	Surface Soil	<1cy
500-7	500-907 – Tanker Truck Release of Hazardous Waste from Tank 231B	Radionuclides Metals VOCs Semivolatile organic compounds (SVOCs) Polychlorinated biphenyls (PCBs)	Surface Soil	<1cy
600-1	600-1001 – Temporary Waste Storage Building 663	VOCs SVOCs	Surface Soil	<1cy
600-6	600-1005 – Former Pesticide Storage Area	Pesticides	Surface Soil	<1cy
700-12	700-1106 – Process Waste Spill – Portal 1	Radionuclides	Surface Soil	<1cy

2.0 IHSS GROUP 300-6

IHSS Group 300-6 includes PAC 300-702 – Pesticide Shed and is shown on Figure 2

2.1 Potential Contaminants of Concern

Potential contaminants of concern (PCOCs) at IHSS Group 300-6 were determined based on process knowledge and indicate pesticides and herbicides may be present in surface soil (DOE 1992 - 2001)

2.2 Project Conditions

The following conditions are present at this site

- A pesticide storage shed is present in this PAC

2.3 Remediation Plan

The remediation plan for IHSS Group 300-6 includes removing contaminated soil to below Tier I Action Levels (ALs) (Figure 2) and collecting confirmation samples in accordance with the Industrial Area Sampling and Analysis Plan (IASAP) (DOE 2001a)

It is anticipated that after remediation there will be areas with concentrations of pesticides and herbicides greater than method detection limits, but below RFCA Tier II ALs at this site

2.4 Stewardship Evaluation

Based on the PCOCs (Table 1 and Section 2 1) and the ER RSOP (DOE 2002), it is anticipated that all contamination above RFCA Tier I ALs will be remediated Figure 2 shows the potential remediation area Additional remediation to below Tier I ALs is not required by RFCA

Because the full extent of excavation and remediation is not known at this time, an additional stewardship evaluation, using the consultative process, will be conducted during remediation A new map of residual contamination will be generated after remediation The following sections contain the stewardship evaluation

2.4.1 Proximity to Other Contaminant Sources

IHSS Group 300-6 is in the RFETS IA The nearest contaminant sources are within IHSS Group 300-1 This site, PCOCs, media of interest, and relationship to IHSS Group 300-6 are listed in Table 2 and shown on Figure 2

Table 2
Other Potential Contaminant Sources for IHSS Group 300-6

[illegible]	[illegible]	[illegible]	[illegible]
300-1 – Oil Burn Pit, Lithium Metal Site, and Solvent Burning Grounds	Depleted Uranium Metals SVOCs VOCs	Surface Soil	Approximately 343 feet to the east

IHSS Group 300-1 does not have PCOCs similar to IHSS Group 300-6 and does not affect stewardship considerations at IHSS Group 300-6

2.4.2 Surface Water Protection

Surface water protection includes the following considerations

Is there a pathway to surface water from potential erosion to streams or drainages?

This site is in a flat-lying area not prone to erosion However, a northeast flowing drainage ditch is located north of the site

Do characterization data indicate there are contaminants in surface soil?

There are no surface soil sampling locations near IHSS Group 300-6

Do monitoring results from Points of Evaluation (POEs) or Points of Compliance (POCs) indicate there are surface water impacts from the area under consideration?

There are no surface water POEs or POCs near IHSS Group 300-6 Therefore it is difficult to attribute potential surface water impacts to IHSS Group 300-6

Is the IHSS Group in an area with high erosion potential, based on the 100-Year Average Erosion Map?

Not applicable The 100-Year Average Erosion Map does not include areas in the IA

2.4.3 Monitoring

Monitoring includes the following considerations

Do monitoring results from POEs or POCs indicate there are groundwater impacts from the area under consideration?

There are no data from surrounding wells indicating groundwater was impacted at this site Well 63495 is upgradient of the site and well P119389 is downgradient

Can the impact be traced to a specific IHSS Group?

There are no data from surrounding wells indicating groundwater was impacted at this site

Are additional monitoring stations needed?

Not applicable

Can existing monitoring locations be deleted if additional remediation is conducted?

Not applicable

2.4.4 Stewardship Actions and Recommendations

The stewardship actions and recommendations for IHSS Group 300-6 are as follows

- Implement near-term institutional controls until final closure and stewardship decisions are implemented, including the following
  - Signs and barriers,
  - Restrictions on soil excavation, and
  - Soil excavations controlled through the Site Soil Disturbance Permit process
- Implement long-term stewardship actions, including the following
  - Federal ownership, and

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- Land use restrictions to prevent soil excavation Specific land use restrictions will be discussed in the Site Long-Term Stewardship Plan

These recommendations may change based on in-process remediation activities and other future RFETS remediation activities

2.5 Accelerated Action Remediation Goals

ER RSOP remedial action objectives include the following

1 Provide a remedy consistent with the RFETS goal of protection of human health and the environment,

2 Provide a remedy that minimizes the need for long-term maintenance and institutional or engineering controls, and

3 Minimize the spread of contaminants during implementation of accelerated actions

The accelerated action goals for IHSS Group 300-6 include the following

1 Remove contaminated soil (if any) to below Tier I ALs (Figure 2)

2.6 Treatment

Not applicable

2.7 Project-Specific Monitoring

High-volume air samplers may be used at the remediation area consistent with work controls to determine airborne radioactivity concentrations Approximate locations of air samplers are shown on Figure 2

2.8 RCRA Units and Intended Waste Disposition

Not applicable

2.9 Administrative Record Documents

DOE, 1992- 2001, Historical Release Report and Quarterly and Yearly Historical Release Report Updates, Rocky Flats Environmental Technology Site, Golden, Colorado

DOE, 2001, Industrial Area Sampling and Analysis Plan, Rocky Flats Environmental Technology Site, Golden, Colorado, June

DOE, 2002, Environmental Restoration RFCA Standard Operating Protocol for Routine Soil Remediation, Rocky Flats Environmental Technology Site, Golden, Colorado, January

2.10 Projected Schedule

Remediation, if required, of IHSS Group 300-6 is expected to begin in April 2002

3.0 IHSS GROUP 500-6

IHSS Group 500-6 includes PAC 500-906 – Asphalt Surface Near Building 559 IHSS Group 500-6 is shown on Figure 3

3.1 Potential Contaminants of Concern

PCOCs at IHSS Group 500-6 were determined based on process knowledge and indicate VOCs may be present in soil beneath the asphalt (DOE 1992 - 2001)

3.2 Project Conditions

The following conditions are present at this site

- Asphalt covers the PAC

3.3 Remediation Plan

The remediation plan for IHSS Group 500-6 includes removing contaminated soil to below Tier I ALs (Figure 3) and collecting confirmation samples in accordance with the IASAP (DOE 2001a)

It is anticipated that after remediation there will be areas with concentrations of VOCs greater than method detection limits, but below RFCA Tier II ALs at this site

3.4 Stewardship Evaluation

Based on the PCOCs (Table 1 and Section 2 1) and the ER RSOP (DOE 2002), it is anticipated that all contamination above RFCA Tier I ALs will be remediated Figure 3 shows the potential remediation area Additional remediation to below Tier I ALs is not required by RFCA

Because the full extent of excavation and remediation is not known at this time, an additional stewardship evaluation, using the consultative process, will be conducted during remediation A new map of residual contamination will be generated after remediation The following sections contain the stewardship evaluation.

3.4.1 Proximity to Other Contaminant Sources

IHSS Group 500-6 is in the RFETS IA Nearby potential contaminant sources, their PCOCs, media of interest, and relationship to IHSS Group 500-6 are listed in Table 3 and shown on Figure 3

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Table 3
Other Potential Contaminant Sources for IHSS Group 500-6

IHSS Group	PCOCs/COCs	Media	Distance from IHSS Group 500-6
000-2 – Original Process Waste Lines (OPWL)	Radionuclides Metals VOCs	Subsurface Soil	Approximately 123 feet to the east
500-1 – Valve Vaults 11, 12, and 13, Scrap Metal Storage Site, and North Site Chemical Storage Site	Radionuclides Metals VOCs	Surface and Subsurface Soil	Approximately 143 feet to the west
500-3 – UBC 559, UBC 528, and Radioactive Site Building 559	Radionuclides Metals VOCs	Subsurface Soil	Approximately 10 feet to the north

Nearby IHSS Groups have VOC PCOCs similar to, and in the same media as, IHSS Group 500-6 It is anticipated that after remediation of these IHSS Groups, they will have residual contamination in subsurface soil similar to the residual contamination anticipated at IHSS Group 500-6

3.4.2 Surface Water Protection

Surface water protection includes the following considerations

Is there a pathway to surface water from potential erosion to streams or drainages?

This site is in a flat-lying area not prone to erosion However, a southeast flowing drainage ditch is located west of the site

Do characterization data indicate there are contaminants in surface soil?

There are no surface soil sampling locations near IHSS Group 500-6

Do monitoring results from POEs or POCs indicate there are surface water impacts from the area under consideration?

There are no surface water POEs or POCs near IHSS Group 500-6 Therefore it is difficult to attribute potential surface water impacts to IHSS Group 500-6

Is the IHSS Group in an area with high erosion potential, based on the 100-Year Average Erosion Map?

Not applicable The 100-Year Average Erosion Map does not include areas in the IA

3.4.3 Monitoring

Monitoring includes the following considerations

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Do monitoring results from POEs or POCs indicate there are groundwater impacts from the area under consideration?

Groundwater sampling results from Boreholes 01895, 01995, and 02095 indicated concentrations of several analytes were above RFCA Tier II ALs Nitrate was the only analyte that exceeded the corresponding Tier I RFCA AL Groundwater at the boreholes was sampled once during drilling and was not sampled at these locations again Table 4 lists data from these boreholes that exceed RFCA ALs

Table 4
Groundwater Exceedances Associated With IHSS Group 500-6

Analyte	Maximum Result (µg/L)	Tier II AL (µg/L)	Tier I AL (µg/L)
Strontium-89/90	1 91	0 85	85 2
Uranium-233/234	4 1	1 06	106
Uranium-238	2 45	0 77	76 8
Analyte	Maximum Result (µg/L)	Tier II AL (µg/L)	Tier I AL (µg/L)
Nitrate	7,910	10	1,000
Nitrite	63 4	1	100
Analyte	**Maximum Result (µg/L)**	**Tier II AL (µg/L)**	**Tier I AL (µg/L)**
Antimony	30 2	6	600
Manganese	2,570	1,720	172,000
Methylene Chloride	20	5	500
Thallium	6 7	2	200

Can the impact be traced to a specific IHSS Group?

There are no data from surrounding wells indicating groundwater was impacted at this site

Are additional monitoring stations needed?

Not applicable

Can existing monitoring locations be deleted if additional remediation is conducted?

Not applicable

3.4.4 Stewardship Actions and Recommendations

The stewardship actions and recommendations for IHSS Group 500-6 are as follows

- Implement near-term institutional controls until final closure and stewardship decisions are implemented, including the following

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  - Signs and barriers,
  - Restrictions on soil excavation, and
  - Soil excavations controlled through the Site Soil Disturbance Permit process

- Implement long-term stewardship actions, including the following
  - Federal ownership, and
  - Land use restrictions to prevent soil excavation Specific land use restrictions will be discussed in the Site Long-Term Stewardship Plan

These recommendations may change based on in-process remediation activities and other future RFETS remediation activities

3.5 Accelerated Action Remediation Goals

ER RSOP remedial action objectives include the following

1 Provide a remedy consistent with the RFETS goal of protection of human health and the environment,

2 Provide a remedy that minimizes the need for long-term maintenance and institutional or engineering controls, and

3 Minimize the spread of contaminants during implementation of accelerated actions

The accelerated action goals for IHSS Group 500-6 include the following

1 Remove contaminated soil (if any) to below Tier I ALs (Figure 3)

3.6 Treatment

Not applicable

3.7 Project-Specific Monitoring

High-volume air samplers may be used at the remediation area consistent with work controls to determine airborne radioactivity concentrations Approximate locations of air samplers are shown on Figure 3

3.8 RCRA Units and Intended Waste Disposition

Not applicable

3.9 Administrative Record Documents

DOE, 1992- 2001, Historical Release Report and Quarterly and Yearly Historical Release Report Updates, Rocky Flats Environmental Technology Site, Golden, Colorado

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DOE, 2001, Industrial Area Sampling and Analysis Plan, Rocky Flats Environmental Technology Site, Golden, Colorado, June

DOE, 2002, Environmental Restoration RFCA Standard Operating Protocol for Routine Soil Remediation, Rocky Flats Environmental Technology Site, Golden, Colorado, January

3.10 Projected Schedule

Remediation, if required, of IHSS Group 500-6 is expected to begin in April 2002

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4.0 IHSS GROUP 500-7

IHSS Group 500-7 includes PAC 500-907 – Tanker Truck Release of Hazardous Waste from Tank 231B IHSS Group 500-7 is shown on Figure 4

4.1 Potential Contaminants of Concern

PCOCs at IHSS Group 500-7 were determined based on process knowledge and indicate radionuclides, metals, PCBs may be present in surface soil along with VOCs in subsurface soil (DOE 1992-2001)

4.2 Project Conditions

The following conditions are present at this site

- The PAC is in a congested area of the Site

4.3 Remediation Plan

The remediation plan for IHSS Group 500-7 includes removing contaminated soil to below Tier I ALs (Figure 4) and collecting confirmation samples in accordance with the IASAP (DOE 2001a)

It is anticipated that after remediation there will be areas with concentrations of radionuclides, metals, PCBs and VOCs greater than background plus two standard deviations or method detection limits, but below RFCA Tier II ALs at this site

4.4 Stewardship Evaluation

Based on the PCOCs (Table 1 and Section 2 1) and the ER RSOP (DOE 2002), it is anticipated that all contamination above RFCA Tier I ALs will be remediated Figure 4 shows the potential remediation area Additional remediation to below Tier I ALs is not required by RFCA

Because the full extent of excavation and remediation is not known at this time, an additional stewardship evaluation, using the consultative process, will be conducted during remediation A new map of residual contamination will be generated after remediation The following sections contain the stewardship evaluation

4.4.1 Proximity to Other Contaminant Sources

IHSS Group 500-7 is in the RFETS IA Nearby potential contaminant sources, their PCOCs, media of interest, and relationship to IHSS Group 500-7 are listed in Table 5 and shown on Figure 4

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Table 5
Other Potential Contaminant Sources for IHSS Group 500-7

IHSS Group	PCOCs/COCs	Media	Distance from IHSS Group 500-7
500-1 – Valve Vaults 11, 12, and 13, Scrap Metal Storage Site, and North Site Chemical Storage Site	Radionuclides Metals VOCs	Surface and Subsurface Soil	Adjacent to the north
500-2 – Radioactive Site Building 551	Radionuclides Metals VOCs	Surface and Subsurface Soil	Approximately 70 feet to the southeast

Nearby IHSS Groups have PCOCs similar to, and in the same media as, IHSS Group 500-7 It is anticipated that after remediation of these IHSS Groups, they will have residual contamination in subsurface soil similar to the residual contamination anticipated at IHSS Group 500-7

4.4.2 Surface Water Protection

Surface water protection includes the following considerations

Is there a pathway to surface water from potential erosion to streams or drainages?

This site is in a flat-lying area not prone to erosion However, two drainage ditches are located along the western and eastern perimeters of the site

Do characterization data indicate there are contaminants in surface soil?

There are no surface soil sampling locations near IHSS Group 500-7

Do monitoring results from POEs or POCs indicate there are surface water impacts from the area under consideration?

There are no surface water POEs or POCs near IHSS Group 500-7 Therefore it is difficult to attribute potential surface water impacts to IHSS Group 500-7

Is the IHSS Group in an area with high erosion potential, based on the 100-Year Average Erosion Map?

Not applicable The 100-Year Average Erosion Map does not include areas in the IA

4.4.3 Monitoring

Monitoring includes the following considerations

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Do monitoring results from POEs or POCs indicate there are groundwater impacts from the area under consideration?

Groundwater monitoring results from Well P114789 indicate concentrations of several analytes above RFCA Tier II ALs Table 6 lists data from this well that exceed RFCA ALs

Table 6
Groundwater Exceedances Associated With IHSS Group 500-7

Analyte	Maximum Result (pCi/L)	Tier II AL (pCi/L)	Tier I AL (pCi/L)
Uranium-233/234	3 2	1 06	106
Uranium-238	2 5	0 768	76 8
Analyte	**Maximum Result (µg/L)**	**Tier II AL (µg/L)**	**Tier I AL (µg/L)**
bis(2-Ethylhexyl)phthalate	130	6	600
Carbon Tetrachloride	480	5	500
Tetrachloroethene	150	5	500
Trichloroethene	71	5	500

Can the impact be traced to a specific IHSS Group?

There are no data from surrounding wells indicating groundwater was impacted at this site Well P114789 is north of the site

Are additional monitoring stations needed?

Not applicable

Can existing monitoring locations be deleted if additional remediation is conducted?

Not applicable

4.4.4 Stewardship Actions and Recommendations

The stewardship actions and recommendations for IHSS Group 500-7 are as follows

- Implement near-term institutional controls until final closure and stewardship decisions are implemented, including the following
  - Signs and barriers,
  - Restrictions on soil excavation, and
  - Soil excavations controlled through the Site Soil Disturbance Permit process
- Implement long-term stewardship actions, including the following

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- Federal ownership, and
- Land use restrictions to prevent soil excavation Specific land use restrictions will be discussed in the Site Long-Term Stewardship Plan

These recommendations may change based on in-process remediation activities and other future RFETS remediation activities

4.5 Accelerated Action Remediation Goals

ER RSOP remedial action objectives include the following

1 Provide a remedy consistent with the RFETS goal of protection of human health and the environment,

2 Provide a remedy that minimizes the need for long-term maintenance and institutional or engineering controls, and

3 Minimize the spread of contaminants during implementation of accelerated actions

The accelerated action goals for IHSS Group 500-7 include the following

1 Remove contaminated soil (if any) to below Tier I ALs (Figure 4)

4.6 Treatment

Not applicable

4.7 Project-Specific Monitoring

High-volume air samplers may be used at the remediation area consistent with work controls to determine airborne radioactivity concentrations Approximate locations of air samplers are shown on Figure 4

4.8 RCRA Units and Intended Waste Disposition

Not applicable

4.9 Administrative Record Documents

DOE, 1992- 2001, Historical Release Report and Quarterly and Yearly Historical Release Report Updates, Rocky Flats Environmental Technology Site, Golden, Colorado

DOE, 2001, Industrial Area Sampling and Analysis Plan, Rocky Flats Environmental Technology Site, Golden, Colorado, June

DOE, 2002, Environmental Restoration RFCA Standard Operating Protocol for Routine Soil Remediation, Rocky Flats Environmental Technology Site, Golden, Colorado, January

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4.10 Projected Schedule

Remediation, if required, of IHSS Group 500-7 is expected to begin in April 2002

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5.0 IHSS GROUP 600-1

IHSS Group 600-1 includes PAC 600-1001 –Temporary Waste Storage Building 663 IHSS Group 600-1 is shown on Figure 5

5.1 Potential Contaminants of Concern

PCOCs at IHSS Group 600-1 were determined based on process knowledge and data collected during previous studies (DOE 1992-2001, 2001a, 2000a) Results of previous sampling and analysis of surface soil near IHSS Group 600-1 (DOE 2000) indicate that radionuclides and metals were detected at concentrations greater than background plus two standard deviations, and SVOCs were detected in surface soil at concentrations greater than method detection limits SVOCs and VOCs were detected in subsurface soil at concentrations greater than RFCA Tier II ALs

5.2 Project Conditions

The following conditions are present at this site

- IHSS Group 600-1 is immediately west of Building 662, and
- Two concrete slabs are in IHSS Group 600-1, which will be recycled in accordance with the RSOP for Recycling Concrete (DOE 1999), or disposed of

5.3 Remediation Plan

The remediation plan for IHSS Group 600-1 includes removing the concrete slabs and contaminated soil to below Tier I ALs (Figure 2) and collecting confirmation samples in accordance with the IASAP (DOE 2001a)

It is anticipated that after remediation there will be areas with concentrations of VOCs greater than method detection limits, but below RFCA Tier II ALs at this site

5.4 Stewardship Evaluation

Based on the PCOCs (Table 1 and Section 2 1) and the ER RSOP (DOE 2002), it is anticipated that all contamination above RFCA Tier I ALs will be remediated Figure 5 shows the potential remediation area Additional remediation to below Tier I ALs is not required by RFCA

Because the full extent of excavation and remediation is not known at this time, an additional stewardship evaluation, using the consultative process, will be conducted during remediation A new map of residual contamination will be generated after remediation The following sections contain the stewardship evaluation

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5.4.1 Proximity to Other Contaminant Sources

IHSS Group 600-1 is in the RFETS IA Nearby potential contaminant sources, their PCOCs, media of interest, and relationship to IHSS Group 600-1 are listed in Table 7 and shown on Figure 5

Table 7
Other Potential Contaminant Sources for IHSS Group 600-1

IHSS Group	PCOCs/COCs	Media	Distance from IHSS Group 600-1
000-2 – OPWL	Radionuclides Metals VOCs	Subsurface Soil	Approximately 30 feet to the north
600-4 – Radioactive Site Building 444 Parking Lot	Radionuclides Metals VOCs	Surface and Subsurface Soil	Adjacent to the west

Nearby IHSS Groups have PCOCs similar to, and in the same media as, IHSS Group 600-1 It is anticipated that after remediation of these IHSS Groups, they will have residual contamination in subsurface soil similar to the residual contamination anticipated at IHSS Group 600-1

5.5 Surface Water Protection

Surface water protection includes the following considerations

Is there a pathway to surface water from potential erosion to streams or drainages?

This site is in a flat-lying area not prone to erosion There are no surface water features in the vicinity of IHSS Group 600-1

Do characterization data indicate there are contaminants in surface soil?

Surface soil sampling results from IHSS Group 600-1 indicate americium and plutonium are present in concentrations greater than background plus two standard deviations and VOC and SVOCs are present in concentrations greater than method detection limit All analytes are well below RFCA Tier II ALs

Do monitoring results from POEs or POCs indicate there are surface water impacts from the area under consideration?

There are no surface water POEs or POCs near IHSS Group 600-1 Therefore it is difficult to attribute potential surface water impacts to IHSS Group 600-1

Is the IHSS Group in an area with high erosion potential, based on the 100-Year Average Erosion Map?

Not applicable The 100-Year Average Erosion Map does not include areas in the IA

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5.5.1 Monitoring

Monitoring includes the following considerations

Do monitoring results from POEs or POCs indicate there are groundwater impacts from the area under consideration?

Groundwater monitoring results from Well P313589, south of the site, indicate concentrations of several analytes above RFCA Tier II ALs Uranium-233/234 and uranium-238 concentrations are greater than RFCA Tier II ALs Additionally, nickel concentrations exceeded the RFCA Tier II AL during the 1st quarter of 2001

Can the impact be traced to a specific IHSS Group?

Uranium-233/234 and uranium-328 are present in concentrations greater than RFCA Tier II ALs in water from Well P313589, downgradient of the site However, uranium was not found in surface or subsurface soil in concentrations greater than background plus two standard deviations Nickel was also found at concentrations greater than the RFCA Tier II ALs in water from this well, but was below background plus two standard deviations Although nickel concentrations for the 1st quarter of 2001 were slightly elevated they have been consistently below the RFCA Tier II AL since 1996 (DOE 2001b) Nickel was not found in concentrations greater than RFCA Tier II ALs in surface or subsurface soil

Are additional monitoring stations needed?

Not applicable

Can existing monitoring locations be deleted if additional remediation is conducted?

Not applicable

5.5.2 Stewardship Actions and Recommendations

The stewardship actions and recommendations for IHSS Group 600-1 are as follows

- Implement near-term institutional controls until final closure and stewardship decisions are implemented, including the following
  - Signs and barriers,
  - Restrictions on soil excavation, and
  - Soil excavations controlled through the Site Soil Disturbance Permit process
- Implement long-term stewardship actions, including the following
  - Federal ownership, and
  - Land use restrictions to prevent soil excavation Specific land use restrictions will be discussed in the Site Long-Term Stewardship Plan

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These recommendations may change based on in-process remediation activities and other future RFETS remediation activities

5.6 Accelerated Action Remediation Goals

ER RSOP remedial action objectives include the following

1 Provide a remedy consistent with the RFETS goal of protection of human health and the environment,

2 Provide a remedy that minimizes the need for long-term maintenance and institutional or engineering controls, and

3 Minimize the spread of contaminants during implementation of accelerated actions

The accelerated action goals for IHSS Group 600-1 include the following

1 Remove contaminated soil (if any) to below Tier I ALs (Figure 5), and

2 Remove concrete slabs, which will be recycled in accordance with the RSOP for Recycling Concrete (DOE 1999), or disposed of

5.7 Treatment

Not applicable

5.8 Project-Specific Monitoring

High-volume air samplers may be used at the remediation area consistent with work controls to determine airborne radioactivity concentrations Approximate locations of air samplers are shown on Figure 5

5.9 RCRA Units and Intended Waste Disposition

Not applicable

5.10 Administrative Record Documents

DOE, 1992- 2001, Historical Release Report and Quarterly and Yearly Historical Release Report Updates, Rocky Flats Environmental Technology Site, Golden, Colorado

DOE, 1999, RFCA Standard Operating Protocol for Recycling Concrete, Rocky Flats Environmental Technology Site, Golden, Colorado, September

DOE, 2000, Industrial Area Data Summary Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September

DOE, 2001, First Quarter RFCA Groundwater Monitoring Report, Rocky Flats Environmental Technology Site, Golden, Colorado, August

DOE, 2001, Industrial Area Sampling and Analysis Plan, Rocky Flats Environmental Technology Site, Golden, Colorado, June

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DOE, 2002, Environmental Restoration RFCA Standard Operating Protocol for Routine Soil Remediation, Rocky Flats Environmental Technology Site, Golden, Colorado, January

5.11 Projected Schedule

Remediation of IHSS Group 600-1 may begin in the 4th Quarter of FY02

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6.0 IHSS GROUP 600-6

IHSS Group 600-6 includes PAC 600-1005 – Former Pesticide Storage Area and is shown on Figure 6

6.1 Potential Contaminants of Concern

PCOCs at IHSS Group 600-6 were determined based on process knowledge and indicate pesticides and herbicides may be present in surface soil (DOE 1992 – 2001)

6.2 Project Conditions

There are no unique project conditions at this site

6.3 Remediation Plan

The remediation plan for IHSS Group 600-6 includes removing contaminated soil to below Tier I ALs (Figure 6) and collecting confirmation samples in accordance with the IASAP (DOE 2001a)

It is anticipated that after remediation there will be areas with concentrations of VOCs greater than method detection limits, but below RFCA Tier II ALs at this site

6.4 Stewardship Evaluation

Based on the PCOCs (Table 1 and Section 2 1) and the ER RSOP (DOE 2002), it is anticipated that all contamination above RFCA Tier I ALs will be remediated Figure 6 shows the potential remediation area Additional remediation to below Tier I ALs is not required by RFCA

Because the full extent of excavation and remediation is not known at this time, an additional stewardship evaluation, using the consultative process, will be conducted during remediation A new map of residual contamination will be generated after remediation The following sections contain the stewardship evaluation

6.4.1 Proximity to Other Contaminant Sources

IHSS Group 600-6 is in the RFETS IA Nearby potential contaminant sources, their PCOCs, media of interest, and relationship to IHSS Group 600-6 are listed in Table 8 and shown on Figure 6

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Table 8
Other Potential Contaminant Sources for IHSS Group 600-6

IHSS Group	PCOCs/COCs	Media	Distance from IHSS Group 600-6
000-2 – OPWL	Radionuclides Metals VOCs	Subsurface Soil	Approximately 144 feet to the east

IHSS Group 000-2 does not have PCOCs similar to IHSS Group 600-6 and does not affect stewardship considerations at IHSS Group 600-6

6.4.2 Surface Water Protection

Surface water protection includes the following considerations

Is there a pathway to surface water from potential erosion to streams or drainages?

This site is in a flat-lying area not prone to erosion and there are no surface water features in the vicinity of IHSS Group 600-6

Do characterization data indicate there are contaminants in surface soil?

There are no surface soil sampling locations near IHSS Group 600-6

Do monitoring results from POEs or POCs indicate there are surface water impacts from the area under consideration?

There are no surface water POEs or POCs near IHSS Group 600-6 Therefore it is difficult to attribute potential surface water impacts to IHSS Group 600-6

Is the IHSS Group in an area with high erosion potential, based on the 100-Year Average Erosion Map?

Not applicable The 100-Year Average Erosion Map does not include areas in the IA

6.4.3 Monitoring

Monitoring includes the following considerations

Do monitoring results from POEs or POCs indicate there are groundwater impacts from the area under consideration?

Groundwater monitoring results from Well P313589, south of the site, indicate concentrations of several analytes above RFCA Tier II ALs Uranium-233/234 and uranium-238 concentrations are greater than RFCA Tier II ALs Additionally, nickel concentrations exceeded the RFCA Tier II AL during the 1st quarter of 2001 (DOE 2001b)

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Can the impact be traced to a specific IHSS Group?

Based on process knowledge, neither uranium nor nickel are expected in surface soil at IHSS Group 600-6 There are no data from surrounding wells indicating groundwater was impacted at this site

Are additional monitoring stations needed?

Not applicable

Can existing monitoring locations be deleted if additional remediation is conducted?

Not applicable

6.4.4 Stewardship Actions and Recommendations

The stewardship actions and recommendations for IHSS Group 600-6 are as follows

- Implement near-term institutional controls until final closure and stewardship decisions are implemented, including the following
  - Signs and barriers,
  - Restrictions on soil excavation, and
  - Soil excavations controlled through the Site Soil Disturbance Permit process
- Implement long-term stewardship actions, including the following
  - Federal ownership, and
  - Land use restrictions to prevent soil excavation Specific land use restrictions will be discussed in the Site Long-Term Stewardship Plan

These recommendations may change based on in-process remediation activities and other future RFETS remediation activities

6.5 Accelerated Action Remediation Goals

ER RSOP remedial action objectives include the following

1 Provide a remedy consistent with the RFETS goal of protection of human health and the environment,

2 Provide a remedy that minimizes the need for long-term maintenance and institutional or engineering controls, and

3 Minimize the spread of contaminants during implementation of accelerated actions

The accelerated action goals for IHSS Group 600-6 include the following

1 Remove contaminated soil (if any) to below Tier I ALs (Figure 6)

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6.6 Treatment

Not applicable

6.7 Project-Specific Monitoring

High-volume air samplers may be used at the remediation area consistent with work controls to determine airborne radioactivity concentrations Approximate locations of air samplers are shown on Figure 6

6.8 RCRA Units and Intended Waste Disposition

Not applicable

6.9 Administrative Record Documents

DOE, 1992- 2001, Historical Release Report and Quarterly and Yearly Historical Release Report Updates, Rocky Flats Environmental Technology Site, Golden, Colorado

DOE, 2001, Industrial Area Sampling and Analysis Plan, Rocky Flats Environmental Technology Site, Golden, Colorado, June

DOE, 2001, First Quarter RFCA Groundwater Monitoring Report, Rocky Flats Environmental Technology Site, Golden, Colorado, August

DOE, 2002, Environmental Restoration RFCA Standard Operating Protocol for Routine Soil Remediation, Rocky Flats Environmental Technology Site, Golden, Colorado, January

6.10 Projected Schedule

Remediation, if required, of IHSS Group 600-6 is expected to begin in April 2002

7.0 IHSS GROUP 700-12

IHSS Group 700-12 includes PAC 700-1106 – Process Waste Spill – Portal 1 IHSS Group 700-12 is shown on Figure 7

7.1 Potential Contaminants of Concern

PCOCs at IHSS Group 700-12 were determined based on process knowledge and indicate radionuclides may be present in surface soil

7.2 Project Conditions

There are no unique project conditions at this site

7.3 Remediation Plan

The remediation plan for IHSS Group 700-12 includes removing contaminated soil to below Tier I ALs (Figure 7) and collecting confirmation samples in accordance with the IASAP (DOE 2001a)

It is anticipated that after remediation there will be areas with concentrations of VOCs greater than method detection limits, but below RFCA Tier II ALs at this site

7.4 Stewardship Evaluation

Based on the PCOCs (Table 1 and Section 2 1) and the ER RSOP (DOE 2002), it is anticipated that all contamination above RFCA Tier I ALs will be remediated Figure 7 shows the potential remediation area Additional remediation to below Tier I ALs is not required by RFCA

Because the full extent of excavation and remediation is not known at this time, an additional stewardship evaluation, using the consultative process, will be conducted during remediation A new map of residual contamination will be generated after remediation The following sections contain the stewardship evaluation

7.4.1 Proximity to Other Contaminant Sources

IHSS Group 700-12 is in the RFETS IA Nearby potential contaminant sources, their PCOCs, media of interest, and relationship to IHSS Group 700-12 are listed in Table 9 and shown on Figure 7

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Table 9
Other Potential Contaminant Sources for IHSS Group 700-12

IHSS Group	PCOCs/COCs	Media	Distance from IHSS Group 700-12
000-3 – IHSS 190 – Central Avenue Ditch Caustic Leak	Sodium Hydroxide	Surface Soil	Approximately 174 feet to the south

IHSS Group 000-3 does not have PCOCs similar to IHSS Group 700-12 and does not affect stewardship considerations at IHSS Group 700-12

7.4.2 Surface Water Protection

Surface water protection includes the following considerations

Is there a pathway to surface water from potential erosion to streams or drainages?

This site is in a flat-lying area not prone to erosion However, there are east flowing drainage ditches located north of the site

Do characterization data indicate there are contaminants in surface soil?

There are no surface soil sampling locations near IHSS Group 600-6

Do monitoring results from POEs or POCs indicate there are surface water impacts from the area under consideration?

There are no surface water POEs or POCs near IHSS Group 600-6 Therefore it is difficult to attribute potential surface water impacts to IHSS Group 600-6

Is the IHSS Group in an area with high erosion potential, based on the 100-Year Average Erosion Map?

Not applicable The 100-Year Average Erosion Map does not include areas in the IA

7.4.3 Monitoring

Monitoring includes the following considerations

Do monitoring results from POEs or POCs indicate there are groundwater impacts from the area under consideration?

There are no groundwater wells in the vicinity of IHSS Group 700-12

Can the impact be traced to a specific IHSS Group?

There are no data from surrounding wells indicating groundwater was impacted at this site

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Are additional monitoring stations needed?

Not applicable

Can existing monitoring locations be deleted if additional remediation is conducted?

Not applicable

7.4.4 Stewardship Actions and Recommendations

The stewardship actions and recommendations for IHSS Group 700-12 are as follows

- Implement near-term institutional controls until final closure and stewardship decisions are implemented, including the following
  - Signs and barriers,
  - Restrictions on soil excavation, and
  - Soil excavations controlled through the Site Soil Disturbance Permit process
- Implement long-term stewardship actions, including the following
  - Federal ownership, and
  - Land use restrictions to prevent soil excavation Specific land use restrictions will be discussed in the Site Long-Term Stewardship Plan

These recommendations may change based on in-process remediation activities and other future RFETS remediation activities

7.5 Accelerated Action Remediation Goals

ER RSOP remedial action objectives include the following

1 Provide a remedy consistent with the RFETS goal of protection of human health and the environment,

2 Provide a remedy that minimizes the need for long-term maintenance and institutional or engineering controls, and

3 Minimize the spread of contaminants during implementation of accelerated actions

The accelerated action goals for IHSS Group 700-12 include the following

1 Remove contaminated soil (if any) to below Tier I ALs (Figure 7)

7.6 Treatment

Not applicable

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7.7 Project-Specific Monitoring

High-volume air samplers may be used at the remediation area consistent with work controls to determine airborne radioactivity concentrations Approximate locations of air samplers are shown on Figure 7

7.8 RCRA Units and Intended Waste Disposition

Not applicable

7.9 Administrative Record Documents

DOE, 1992- 2001, Historical Release Report and Quarterly and Yearly Historical Release Report Updates, Rocky Flats Environmental Technology Site, Golden, Colorado

DOE, 2001, Industrial Area Sampling and Analysis Plan, Rocky Flats Environmental Technology Site, Golden, Colorado, June

DOE, 2002, Environmental Restoration RFCA Standard Operating Protocol for Routine Soil Remediation, Rocky Flats Environmental Technology Site, Golden, Colorado, January

7.10 Projected Schedule

Remediation, if required, of IHSS Group 700-12 is expected to begin in April 2002

8.0 PUBLIC PARTICIPATION

ER RSOP Notification #02-04 activities were discussed at the March, 2002 ER/D&D Status meeting This Notification is available at the Rocky Flats Reading Rooms and on the Environmental Data Dynamic Information Exchange (EDDIE) website at www rfets gov

9.0 REFERENCES

DOE, 1992 through 2001 Historical Release Report and, Quarterly and Yearly Historical Release Report Updates Rocky Flats Environmental Technology Site, Golden, Colorado

DOE, 1999, RFCA Standard Operating Protocol for Recycling Concrete, Rocky Flats Environmental Technology Site, Golden, Colorado, September

DOE, 2000, Industrial Area Data Summary Report, Rocky Flats Environmental Technology Site, Golden, Colorado, September

DOE, 2001a, Industrial Area Sampling and Analysis Plan, Rocky Flats Environmental Technology Site, Golden, Colorado, June

DOE, 2001b, First Quarter RFCA Groundwater Monitoring Report for Calendar Year 2001, Rocky Flats Environmental Technology Site, Golden, Colorado, August

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DOE, 2002, Environmental Restoration RFCA Standard Operating Protocol for Routine Soil Remediation, Rocky Flats Environmental Technology Site, Golden, Colorado, January

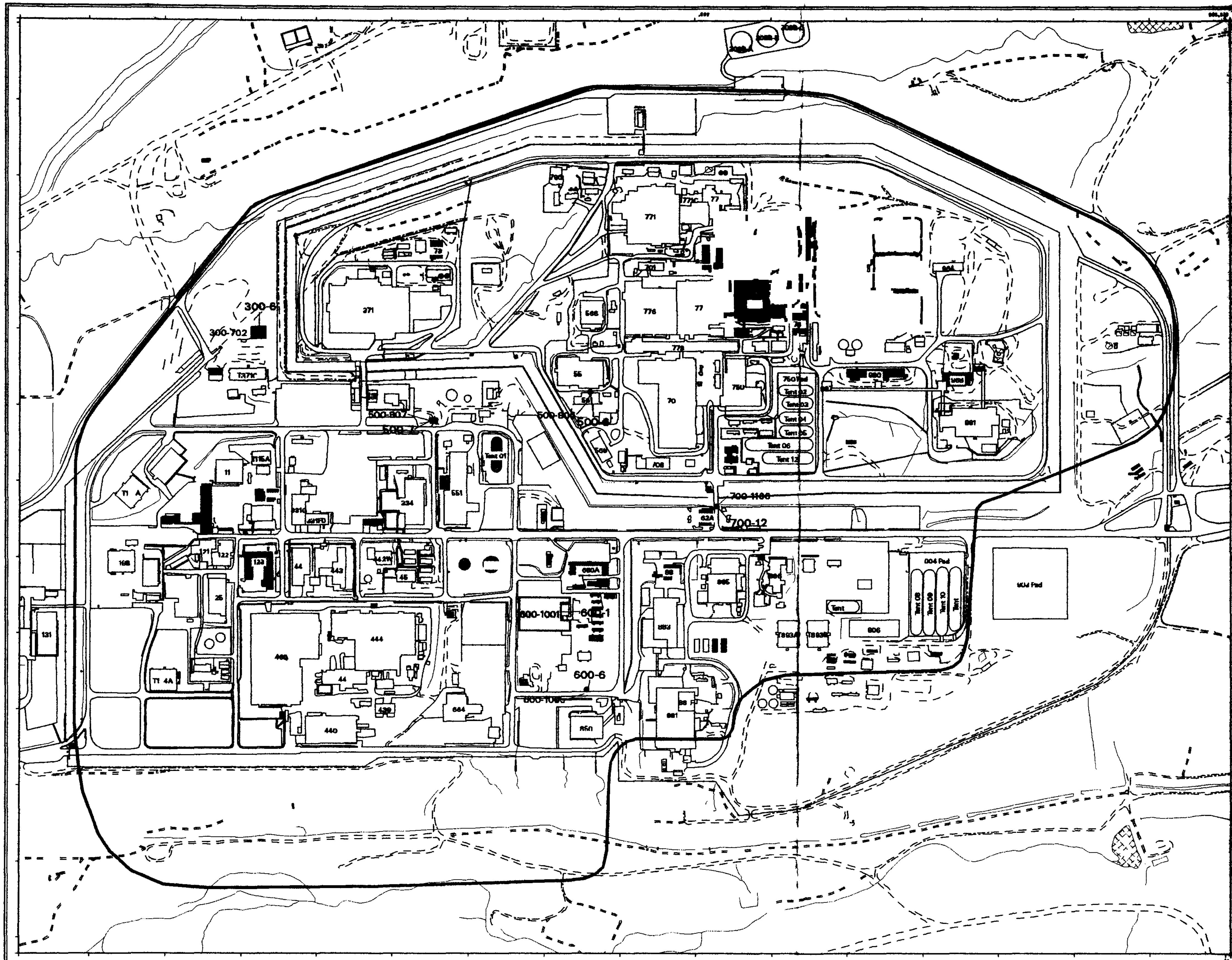

Figure 1
IA Groups Location Map

EXPLANATION

IHSS Groupings

- 300-6
- 500-6
- 500-7
- 600-1
- 600-6
- 700-12

Standard Map Features

- Buildings and other structures
- Demolished buildings
- Solar Evaporation Ponds (SEPs)
- Lakes and ponds
- Streams, ditches, or other drainage features
- Fences and other barriers
- Paved roads
- Dirt roads
- Industrial Area Operable Unit Boundary

Scale 6330

State Plane Coordinate Projection
Colorado Central one
Datum NAD

U S Depa tment of E ergy
R cky Flats Environm ntal Technology Site

Prepared by: DynCorp

Prepared for: KAISER HILL

April 29, 2002

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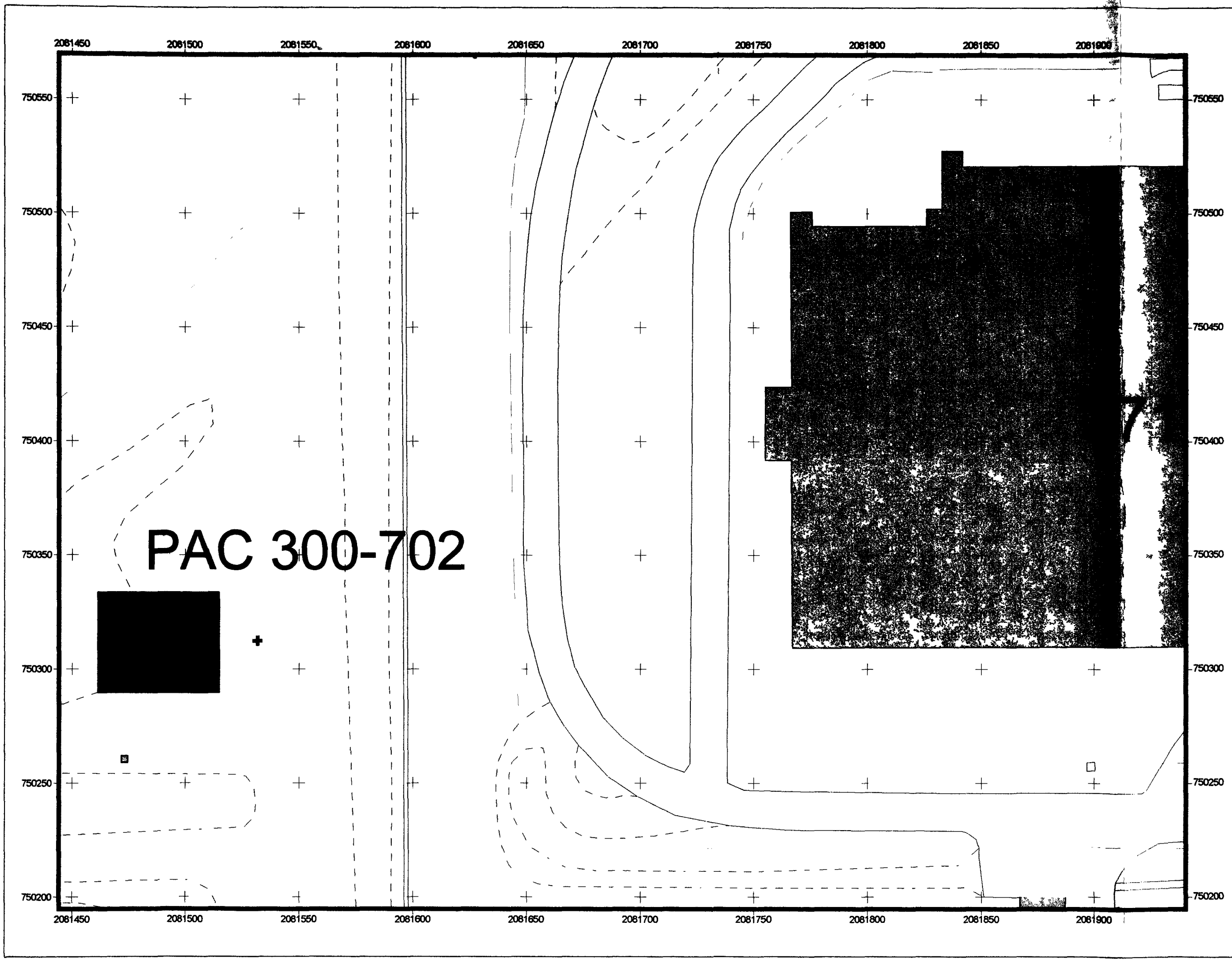

Figure 2
Potential Remediation Area
IHSS Group 300-6 (300 702)

KEY

- Potential Air Sampling Location
- Other IHSSs
- FY 2002 IHSS location
- FY 2002 PAC location
- FY 2002 UBC location
- Building/structure
- Paved area
- Dirt road
- Stream ditch or other drainage feature

Existing soil sampling locations (50 ft buffer)

- Both subsurface and surface soil
- Subsurface soil
- Surface soil

N

Scale 1 900

10 0 10 20 30 40 50 60 Feet

State Plane Coordinate Projection
Colorado Central Zone
Datum NAD 27

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Prepared for KAISER HILL

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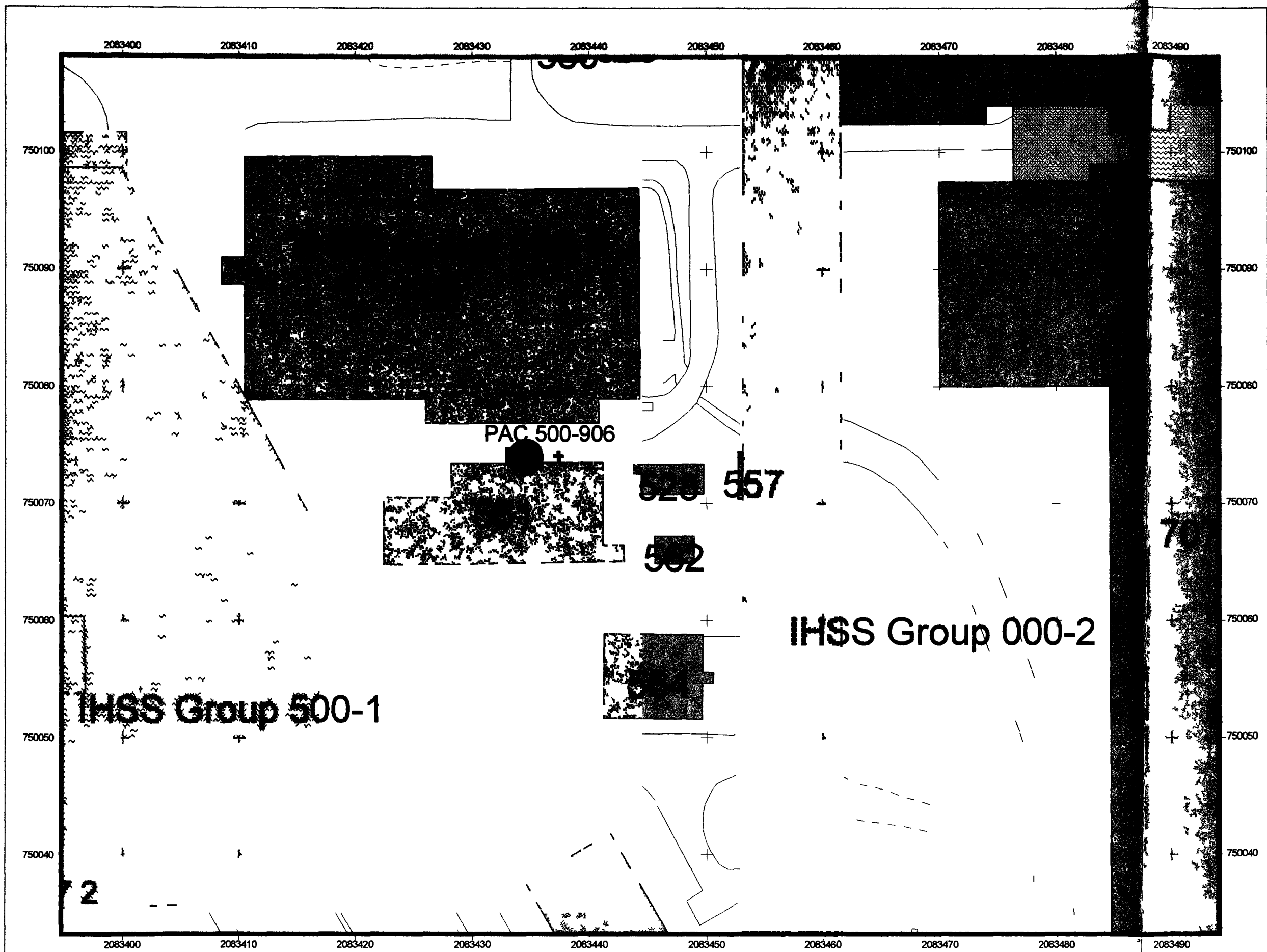

Figure 3
Potential Remediation Area
IHSS Group 500-6 (500 906)

KEY

- Potential Air Monitoring Location
- Other IHSSs
- FY 2002 IHSS location
- FY 2002 PAC location
- FY 2002 UBC location
- Building/structure
- Paved area
- Dirt road
- Stream ditch or other drainage feature

Existing soil sampling locations (50 ft buffer)

- Both subsurface and surface soil
- Subsurface soil
- Surface soil

N

Scale 1 925

20 0 20 40 60 Feet

State Plane Coordinate Projection
Colorado Central Zone
Datum NAD 27

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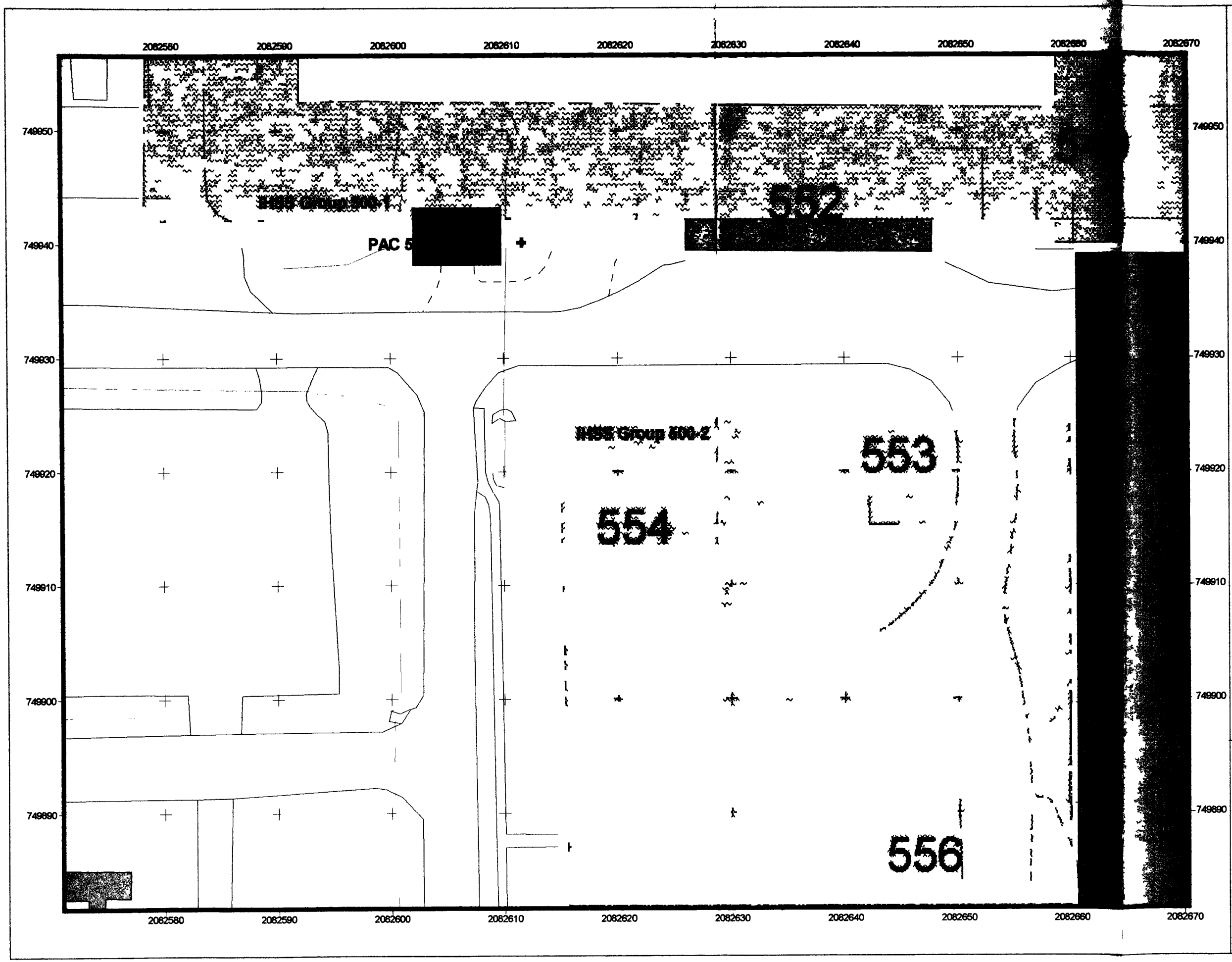

Figure 4
Potential Remediation Area
IHSS Group 500 7 (500 907)

KEY

- Potential Air Monitoring Location
- Other IHSSs
- FY 2002 IHSS location
- FY 2002 PAC location
- FY 2002 UBC location
- Building/structure
- Paved area
- Dirt road
- Stream ditch or other drainage feature

Existing soil sampling locations (50-ft buffer)

- Both subsurface and surface soil
- Subsurface soil
- Surface soil

N

Scale 1 465

10 0 10 20 Feet

State Plane Coordinate Projection
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Datum NAD 27

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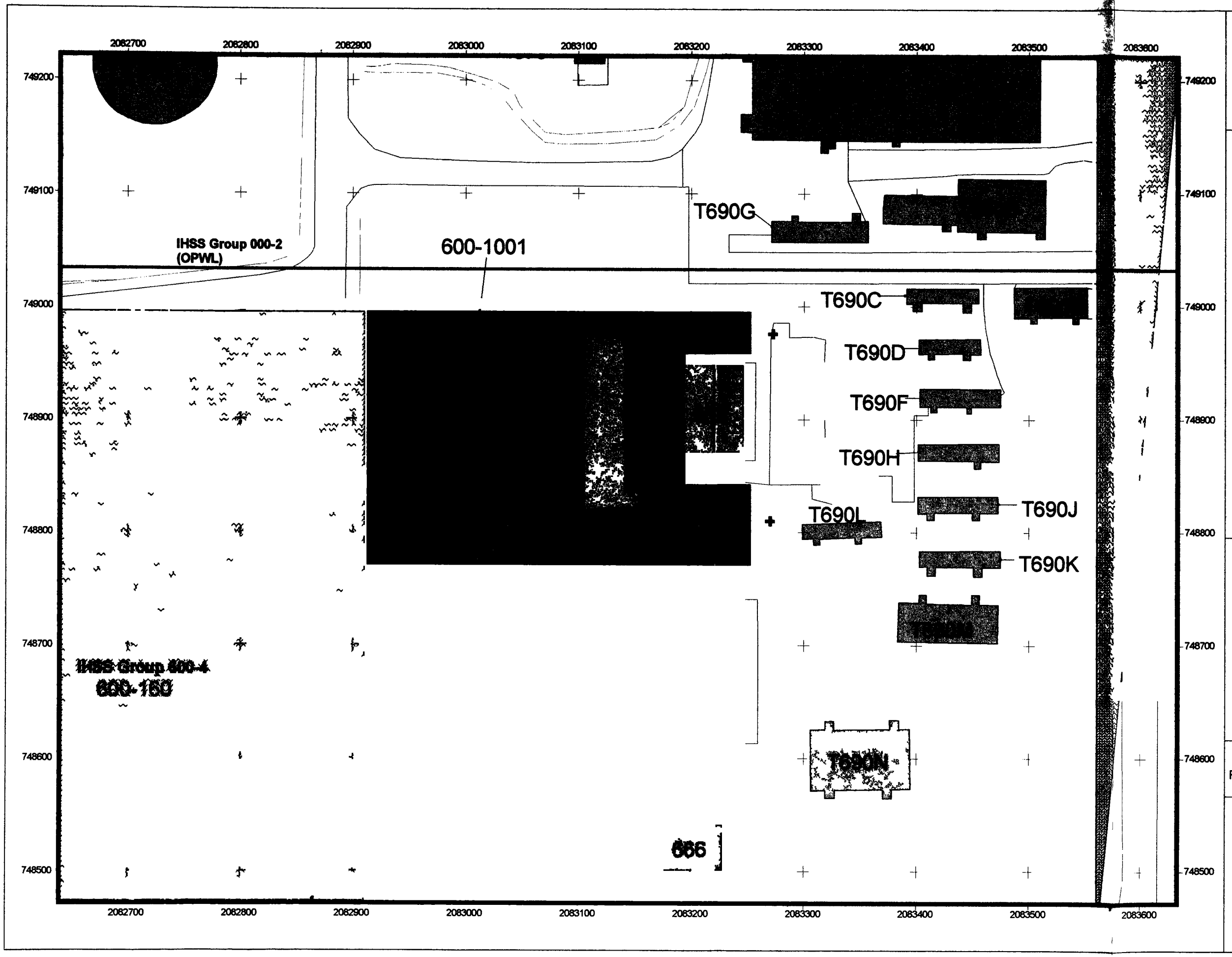

Figure 5
Potential Remediation Area
IHSS Group 600 1 (600 1001)

KEY

- Potential Air Monitoring Location
- Other IHSSs
- FY 2002 IHSS location
- FY 2002 PAC location
- FY 2002 UBC location
- Building/structure
- Paved area
- Dirt road
- Stream ditch or other drainage feature

Existing soil sampling locations (50-ft buffer)

- Both subsurface and surface soil
- Subsurface soil
- Surface soil

N

Scale 1 618

20 0 20 40 Feet

State Plane Coordinate Projection
Colorado Central Zone
Datum NAD 27

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Figure 6
Potential Remediation Area
IHSS Group 600-6 (600 1005)

KEY

- Potential Air Monitoring Location
- Other IHSSs
- FY 2002 IHSS location
- FY 2002 PAC location
- FY 2002 UBC location
- Building/structure
- Paved area
- Dirt road
- Stream ditch or other drainage feature

Existing soil sampling locations (50-ft buffer)

- Both subsurface and surface soil
- Subsurface soil
- Surface soil

N

Scale 1 280

4 0 4 8 12 Feet

State Plane Coordinate Projection
Colorado Central Zone
Datum. NAD 27

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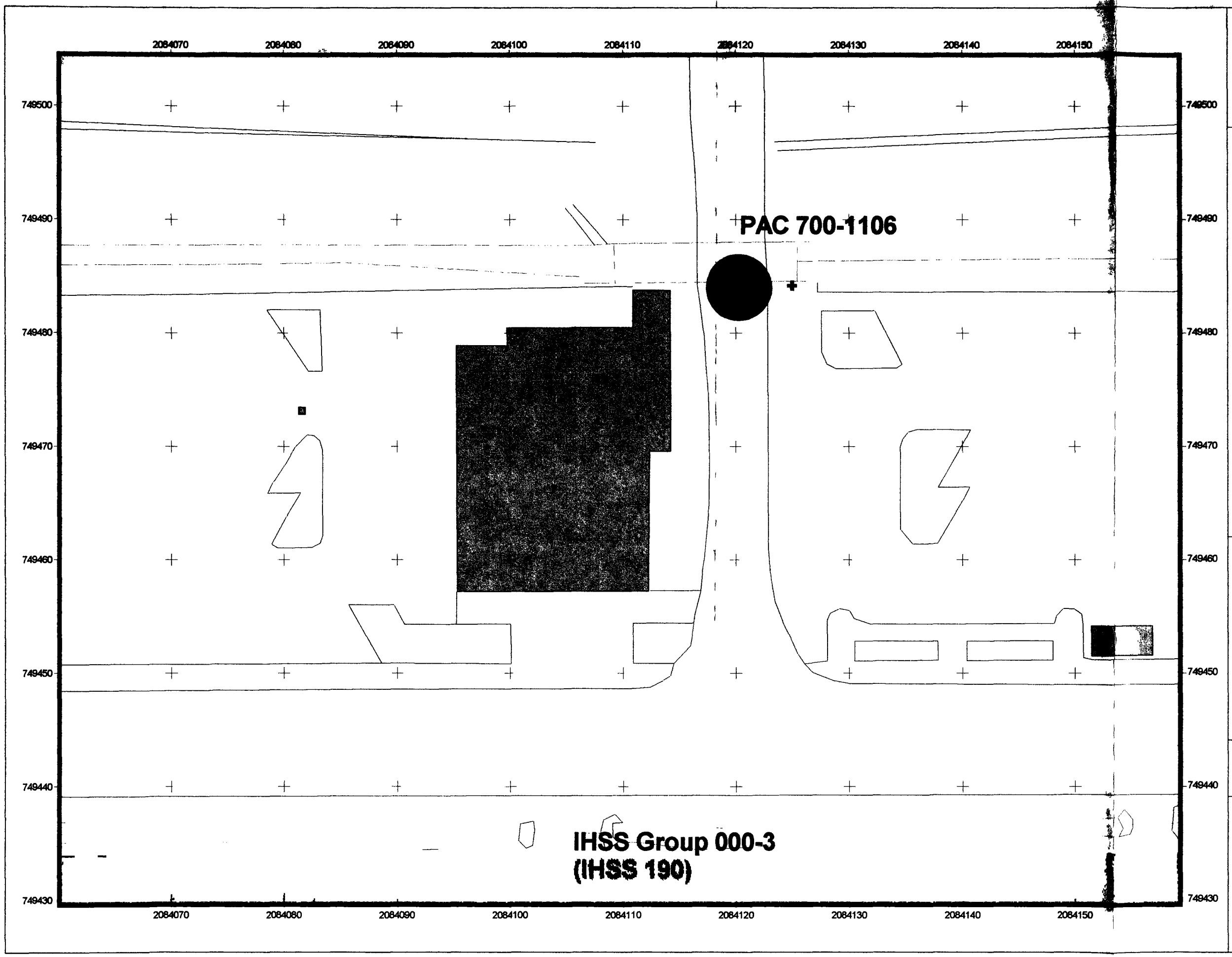

Figure 7
Potential Remediation Area
IHSS Group 700 12 (700 1106)

KEY

- Potential Air Monitoring Location
- Other IHSSs
- FY 2002 IHSS location
- FY 2002 PAC location
- FY 2002 UBC location
- Building/structure
- Paved area
- Dirt road
- Stream ditch or other drainage feature

Existing soil sampling locations (50-ft buffer)

- Both subsurface and surface soil
- Subsurface soil
- Surface soil

N

Scale 1 510

4 0 4 8 12 Feet

State Plane Coordinate Projection
Colorado Central Zone
Datum NAD 27

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